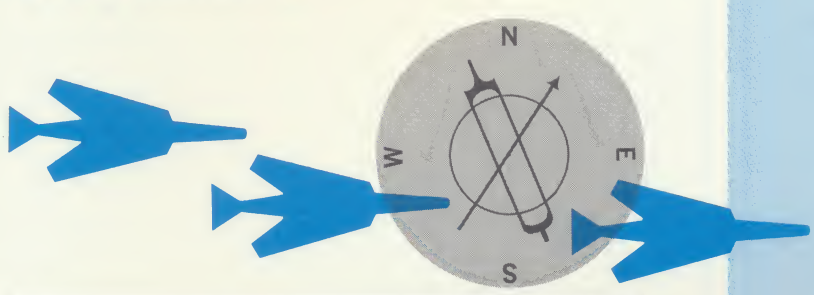
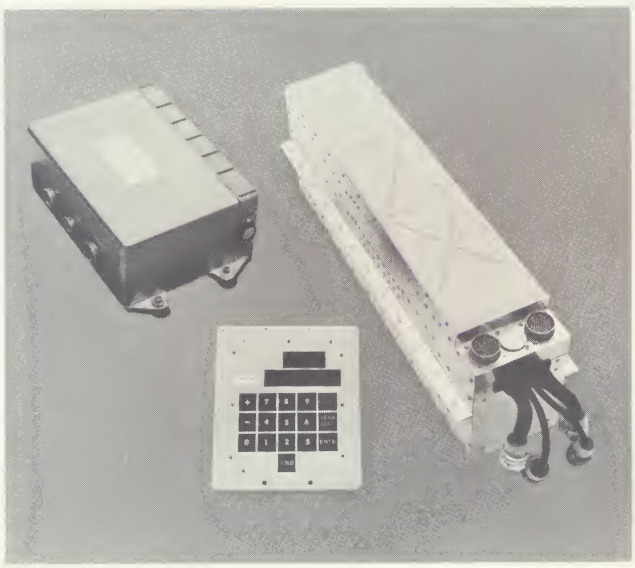
TRW SYSTEMS

TACTICAL AVIONICS AND LIMITED WARFARE EQUIPMENT

NAVIGATE





Lightweight, Low-Powered STRAP DOWN INERTIAL GUIDANCE SYSTEM

This system is a self-contained, strap down inertial assembly which is adaptable to a wide variety of manned and unmanned missions including missile, spacecraft, and aircraft tactical guidance. It is being produced by TRW Systems for the Apollo Lunar Excursion Module.

Major features:

- Maintains attitude reference
- Computes attitude errors
- Drives attitude displays
- Computes and displays navigational data
- Solves explicit guidance equations
- Provides guidance, steering, and engine commands

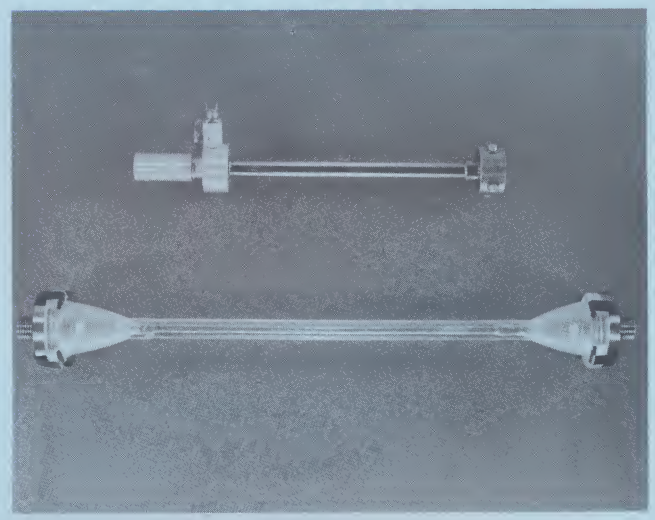
MARCO 4418 COMPUTER

The Marco 4418 general-purpose, binary digital computer was developed by TRW Systems for airborne and spaceborne applications. It is currently being used in the Apollo Lunar Excursion Module and is shown at right in the photo above.

Major features:

- Man-rated
- Small size: 0.56 ft^3
- Light weight: 32.5 lbs.
- High reliability: MTBF 20,000 hrs.
- Low power requirements: 75 watts
- Parallel arithmetic system, 18-bit word length
- Ferrite core, 4096-word memory (expandable to 8192 words)
- Cycle time: 5 microseconds
- Tailored software package

PERFORM PHOTO RECONNAISSANCE



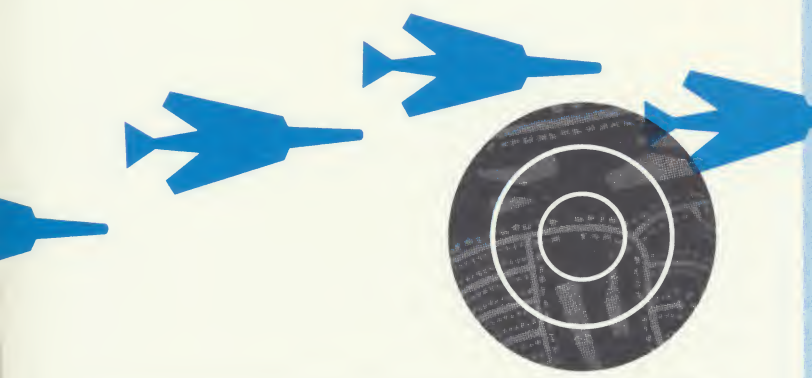
HIGH-INTENSITY ABLATING LAMP

TRW developmental ablating lamps produce high-intensity, short-duration radiation which can be used for illumination of targets in low-altitude aerial photography. The lamp is equally adaptable to IR and UV beacon applications (ground or airborne). It can also be developed as a completely self-contained light source to meet specific customer requirements.

Major features:

- Yields 210 joules of visible radiation in the wavelength range 0.37 to 1.1 microns
- Can be made to produce ground illumination in a 45° cone equivalent to a 300,000 candle-second flare
- Pulse durations as low as 10 microseconds (much shorter than pyrotechnic flares or xenon flash devices)
- Can be made to operate up to 1500 feet at high aircraft speeds (no image-motion compensation required)
- Radiation temperatures up to 35,000°K
- Resistant to high vibration and shock environments

ACQUIRE AND IDENTIFY TARGETS



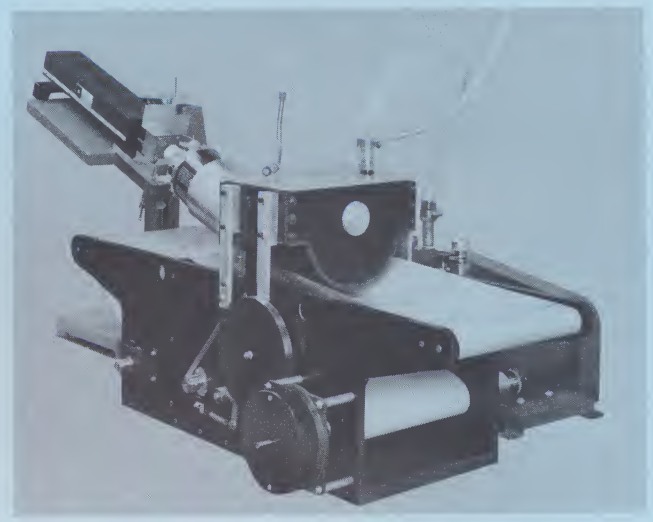
ACQUISITION AND IDENTIFICATION SYSTEMS

This extremely simple system of novel design has demonstrated a marked superiority in an operational environment. Signal format is inherently compatible with digital processing leading to light-weight, low-cost configurations for ground and aerospace vehicles.

Major features:

- Continuous inflight tracking and position-fixing of radiating targets
- Multiple target tracking in dense radiation environments
- Precision tracking over large look angles
- Acquisition and monitor displays
- Real time inflight identification
- Frequency, PRF, pulse width, and scan rate
- Rapid threat assessment
- Computer compatible data format
- No recalibration requirement

RECORD SIGNATURES



WIDEBAND LASER RECORDER/REPRODUCER

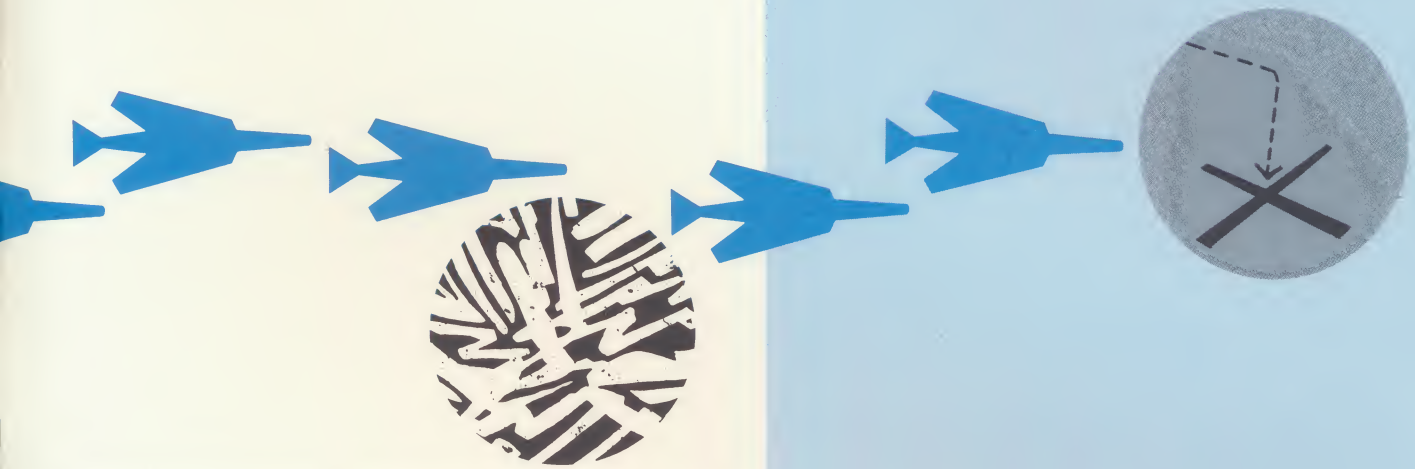
TRW Systems has developed a recorder and playback system which uses laser and electro-optic techniques to achieve 200-mc recording on photographic film. The system has direct applications in photo-reconnaissance, high-rate PCM telemetry, and Elint recording.

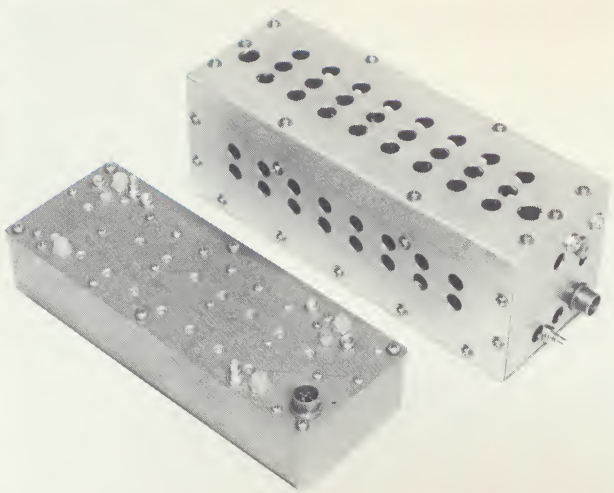
Major features:

- Incorporates up to 50 lbs. of high-resolution film for 8 hours continuous recording
- Data tracks as narrow as 2.5 microns
- Hysteresis-synchronous, motor-driven, multi-sided mirror scanner
- Conventional diffraction-limited optics
- Servo-controlled film transport playback unit
- Weight: 100 lbs.
- Power input: 200 watts

JAM COMMUNICATIONS AND THREAT RADAR

CONTROL AN ASM





DISTRIBUTED AMPLIFIERS

TRW Systems produces a series of reliable, lightweight Broadband Power Amplifiers for use in countermeasures and special communications applications. Complete jamming systems, including power supply and heat exchanger, are packaged to specific customer requirements.

Major features:

- Linear response over bandwidths in excess of one octave
- Power outputs as high as 3 kw
- Frequency coverage: dc to 450 mc
- Overall efficiency (AC line to RF output): 20%
- Operates up to 75,000 feet
- Resistant to high vibration and shock environments

OPTICAL CORRELATION GUIDANCE

In addition to its electronic intelligence functions the TRW acquisition and identification avionics is capable of providing useful target location inputs to the ASM. This capability is complemented by a unique optical correlation tracking system now in development. After launch from a plane, the missile is brought by mid-course maneuvers to a region where acquisition and tracking functions can be performed. The TRW tracking system is then enabled and guides the missile to the target. The tracking system . . .

- Uses phase rather than intensity or "peak" data
- Uses electronic data rather than photographic storage, thus simplifying tracker hardware
- Minimizes reconnaissance data requirements.
- Permits oblique dive angles
- Exhibits excellent acquisition capability
- Uses existing equipment which is both simple and inexpensive

TRW Systems

Designs and Builds a Wide Range of Avionics Equipment for Tactical Applications in Missiles, Spacecraft, Aircraft and Ground Vehicles

Whatever your present hardware requirements, we can supply you with individual components and subsystems, or with completely integrated systems that are are compatible with existing airborne and ground equipment. We are also prepared to assist you in the design and development of advanced equipment for your future hardware requirements.

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